Patent Claims

1. A measuring device for locating a partial discharge on a conductor bar (3), which has electrical external insulation, in a dynamoelectrical machine (1), characterized in that a first sensor (5) and a second sensor (6), which are designed to detect signals which are caused by the partial discharge and propagate along the conductor bar (3), with the first sensor (5) being designed to emit a first partial discharge output signal (42), which reflects a first detection time and is applied to the first sensor (5) and with the second sensor (6) being designed to emit a second partial discharge output signal (43), which reflects a second detection time and is applied to the second sensor (6) are arranged at a distance (1) from one another on the conductor bar (3), and the first partial discharge output signal (42) and the second partial discharge output signal (43) are supplied to an evaluation unit (44) which is designed to locate the partial discharge on the conductor bar (3).

2. The measuring device as claimed in claim 1, characterized in that the evaluation unit (44) has a time difference module (45) with a first time difference signal input (47), a second time difference signal input (48) and a time difference output (49), with the first partial discharge output signal (42) being applied to the first time difference signal input (47), and the second partial discharge output signal (43) being applied to the second time difference signal input (48), with the evaluation unit (44) being designed such that a time difference between the arrival of the first partial discharge output signal (42) from the first sensor (5) at the time difference module (45) and the arrival

of the second partial discharge output signal (43) from the second sensor (6) at the time difference module (45) is determined, and is produced as the time difference output signal at the time difference output (49), with the evaluation unit (44) having a calculation module (46) with a calculation input (50) to which the time difference output signal is applied, and which is designed such that a partial discharge location value is calculated, which indicates the point of origin (7) of the partial discharge on the conductor bar (3).

3. The measuring device as claimed in claim 2, characterized in that the evaluation unit (44) is designed to determine the partial discharge location value using the equation $l1 = (l + v\,\Delta t)/2$ where l is the distance between the first sensor (5) and the second sensor (6), l1 is the distance between the point of origin (7) of the partial discharge and the centre between the first sensor (5) and the second sensor (6), v is the propagation speed of the partial discharge, and Δt is the time difference.

4. The measuring device as claimed in one of claims 1 to 3, characterized in that the first sensor (5) or the second sensor (6) is a capacitively acting sensor.

5. The measuring device as claimed in one of claims 1 to 3, characterized in that the first sensor (5) or the second sensor (6) is an inductively acting sensor.

6. The measuring device as claimed in one of claims 1 to 3, characterized in that

the first sensor (5) or the second sensor (6) is a direct-axis voltage sensor.

7. Use of the measuring device as claimed in one of claims 1 to 6 in a generator.

8. Use of the measuring device as claimed in one of claims 1 to 6 in a transformer.

9. A sensor (5, 6) for determination of partial discharges, characterized by
an electrically conductive electrode (23) which is in the form of a sheet and has a front face (35) and a rear face (36), with external insulation (24) being applied to the front face (35) and with two coaxial cables (26), which are in the form of connections (25), being arranged on the electrode (23), with a dielectric (27) being attached to the rear face (36) of the electrode (23), and with a shielding electrode (31) being attached to the dielectric (27) by means of a transfer adhesive (28).

10. The sensor (5, 6) as claimed in claim 9, characterized in that
the electrode (23) is produced from an elastic material.

11. The sensor (5, 6) as claimed in claim 9 or 10, characterized in that
the electrode (23) is produced from rolled copper adhesive film.

12. The sensor (5, 6) as claimed in claim 9 or 10, characterized in that the electrode (23) is formed from a layer assembly composed of polyimide and rolled copper.

13. The sensor (5, 6) as claimed in claim 9, characterized in that
the external insulation (24) is produced from the material

high-density polyethylene or polypropylene.

14. The sensor (5, 6) as claimed in claim 9, characterized in that the dielectric (27) is formed from a closed-pore polyethylene foam which is free of fluoro-chlorohydrocarbons.

15. The sensor (5, 6) as claimed in claim 9, characterized in that the shielding electrode (31) has copper-coated glass-fiber epoxy resin.

16. The sensor (5, 6) as claimed in claim 9, characterized in that the shielding electrode (31) has a thickness between 0.30 mm and 0.60 mm.

17. The sensor (5, 6) as claimed in one of claims 9 to 16, characterized in that the electrode (23) is in two parts.

18. Use of a sensor (5, 6) as claimed in one of claims 9 to 17 as an inductive sensor.

19. Use of a sensor (5, 6) as claimed in one of claims 9 to 17 as a capacitive sensor.

20. Use of a sensor (5, 6) as claimed in one of claims 9 to 17 as an direct-axis voltage sensor.

21. A method for detecting and locating a partial discharge in a conductor bar (3) which has electrical external insulation, in a dynamoelectrical machine (1), characterized in that

a first sensor (5) and a second sensor (6) are fitted to the conductor bar (3) at a distance (1) from one another

in order to detect signals which are caused by the partial discharge and propagate along the conductor bar (3), the first sensor (5) supplies a first partial discharge output signal (42) to an evaluation unit (44) and the second sensor (6) supplies a second partial discharge output signal (43) to the evaluation unit (44), and the evaluation unit (44) uses the distance (1) and the time of arrival of the first partial discharge output signal (42) and of the second partial discharge output signal (43) to determine the point of origin (7) of the partial discharge.